

Notice of Allowability

Application No.

10/001,742

Examiner

Djenane M. Bayard

Applicant(s)

BOHRER ET AL.

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 4/25/05.
2. ☒ The allowed claim(s) is/are 1,3-8,10-15,17 and 18.
3. ☒ The drawings filed on 31 October 2001 are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|--|--|
| 1. <input type="checkbox"/> Notice of References Cited (PTO-892) | 5. <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 6. <input type="checkbox"/> Interview Summary (PTO-413),
Paper No./Mail Date _____. |
| 3. <input type="checkbox"/> Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No./Mail Date _____. | 7. <input checked="" type="checkbox"/> Examiner's Amendment/Comment |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit
of Biological Material | 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance |
| | 9. <input type="checkbox"/> Other _____. |

PD

DETAILED ACTION

EXAMINER'S AMENDMENT

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Richard Frankeny on 8/4/05. The application has been amended as follows:

Claims 1, 8 and 15 have been amended. Claims 2, 9 and 16 has been cancelled. Claim 1 now reads as follow :

A method for managing workload distribution in a multiple processor cluster system to conserve energy, comprising the steps of: classifying persistent states and connections within said cluster system according to an activity referencing said persistent states and connections; receiving a request to modify a workload of said cluster system; determining a minimum number of processors in said cluster system for executing said modified workload while maintaining said persistent states and connections; determining a workload distribution within said minimum number of processors that satisfies said modified workload while maintaining said persistent states and connections; and modifying an operation mode of a selected processor in said processors of said cluster system to conserve energy while satisfying said modified workload while maintaining said persistent states and connections and migrating persistent states and connections within said cluster system to effect said workload distribution.

Claim 8 now reads as follow :

A cluster system comprising multiple processor central processing units (CPU)s having circuitry for classifying persistent states and connections within said cluster system according to an activity referencing said persistent states and connections, circuitry for receiving a request to modify a workload of said cluster system, circuitry for determining a minimum number of processors in said cluster system for executing said modified workload while maintaining said persistent states and connections, circuitry for determining a workload distribution within said minimum number of processors that satisfies said modified workload while maintaining said persistent states and connections, and circuitry for modifying an operation mode of a selected processor in said processors of said cluster system to conserve energy while satisfying said modified workload while maintaining said persistent states and connections; a random access memory (RAM); a communications adapter coupled to a communication network; and a bus system coupling said CPUs to said communications adapter and said RAM and wherein the cluster system further comprises migrating persistent states and connections within said cluster system to effect said workload distribution.

Claim 10-13 are now dependent of claim 8 and read as follow:

10. The cluster system of claim 8, wherein said operation mode of said selected processor is modified by setting said selected processor to an off mode.

11. The cluster system of claim 8, wherein said operation mode of said selected processor is modified by setting said selected processor to a stand-by mode.

12. The cluster system of claim 8, wherein said operation mode of said selected processor is modified by setting said selected processor to an active full power mode from an off or a stand-by mode.

13. The cluster system of claim 8, wherein said step of determining said workload distribution for said minimum number of processors uses a constraint based bin packing algorithm.

Claim 15 now reads as follow:

15. A computer program product for managing workload distribution in a multiple processor cluster system to conserve energy, said computer program product embodied in a machine readable medium for energy management in a computer system having a plurality of computation nodes, including programming for a processor, said computer program comprising a program of instructions for performing the program steps of: classifying persistent states and connections within said cluster system according to an activity referencing said persistent states and connections; receiving a request to modify a workload of said cluster system; determining a minimum number of processors in said cluster system for executing said modified workload while maintaining said persistent states and connections; determining a workload distribution within said minimum number of processors that satisfies said modified workload while

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maintaining said persistent states and connections; modifying an operation mode of a selected processor in said processors of said cluster system to conserve energy while satisfying said modified workload while maintaining said persistent states and connections and migrating persistent states and connections within said cluster system to effect said workload distribution.

Allowable Subject Matter

Claims 1, 3-8, 10-15 and 17-21 are allowed.

The following is an examiner's statement of reasons for allowance: the application has been allowed in light of the following limitation " modifying an operation mode of a selected processor in said processors of said cluster system to conserve energy while satisfying said modified workload while maintaining said persistent states and connection" in combination with "migrating persistent stated and connections within said cluster system to effect said workload distribution".

Conclusion

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Djenane M. Bayard whose telephone number is (571) 272-3878.

The examiner can normally be reached on Monday- Friday 5:30 AM- 3:00 PM..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rupal Dharia can be reached on (571) 272-3880. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Djenane Bayard

Patent Examiner


RUPAL DHARIA
SUPERVISORY PATENT EXAMINER